REMARKS

The following comments address all stated grounds for rejection, and we believe place the presently pending claims, as identified below, in condition for allowance. Upon entry of this paper, claims 1,8, 15, 19, and 24 have been amended, no claims have been canceled, and no claims have been added as new claims, thus claims 1-26 are presently pending in this Application. No new matter has been added.

Objections to Drawings

The formal drawings submitted with the previous Office Action Response were disapproved due to errors in Figures 5 and 9. Replacement drawings of Figures 5 and 9 have been prepared and are submitted herewith along with copies showing the changes made.

Claim Rejections Pursuant to 35 U.S.C. §112

Claims 8-14 were rejected pursuant to 35 U.S.C. §112 as containing subject matter which was not described in the specification. Although applicant disagrees that with the proposition that one skilled in the art would not recognized that the CAD model could include an object method, Applicants have amended claim 8 (upon which claims 9-14 are dependent) to remove the limitation.

Claim Rejections Pursuant to 35 U.S.C. §102(a)

Claims 1-2, 5-8, 11-14, 19-20 and 23-26 were rejected pursuant to 35 U.S.C. 102(a) as being anticipated by Fane, *"Your Table is Waiting..."*, CADalyst, January 1999, pages 70-75. The Applicants respectfully traverse each of these rejections in light of the amendments above and for the reasons stated below.

Summary of Claimed Invention

The illustrative embodiment of the present invention describes a computer system running a CAD package which is interfaced with an external Application program (EAP). The CAD package includes a model of an object. The model of the object includes output data from the EAP which is integrated into the model such that future changes to the model require additional calculations to be performed by the EAP. The model is then modified and a determination is programmatically reached that the modification requires recalculation of the EAP output data. New input data is sent to the EAP without user input in response to the determination that the modification of the model requires recalculation of the EAP output data. This programmatic request to the EAP is the result of the integration of the EAP output data into the model. New output data is then received back from the EAP and reintegrated into the model. In other words, a two way communication process by which the CAD package and model automatically determines the need to send new input data to the EAP, run it, and obtain new output data from the EAP, is disclosed.

Summary of Fane

Fane describes a computer system running a CAD package that is used in conjunction with a Microsoft Excel spreadsheet. The article describes a methodology to tie a set of parameters to the Excel spreadsheet. The CAD model may be used to create a spreadsheet holding values of model components. Existing spreadsheets may also be associated with the model. The Excel spreadsheet then acts as a database from which the CAD model is fed parameter values. Once the spreadsheet has been set up, data is communicated in one direction only, from the spreadsheet to the CAD model. Put another way, data is retrieved from the spreadsheet and the model components are changed to reflect the spreadsheet contained values. The CAD model does not feed values to the Excel spreadsheet after the association between the two files has been established. Any additional updating of the model is done by a user manually selecting an update control from the CAD program interface.

Claim 1 (upon which claims 2-7 are dependent) has been amended to clarify that the output data from the EAP is integrated into the model, that the determination that the modifying

of the model requires recalculation of the output data from the EAP takes place programmatically, and that the request to the EAP for new output data also takes place programmatically. Fane does not disclose the integration of the output data into the model and the subsequent programmatic determination that a recalculation of EAP data is necessary. Fane discloses an update process that is manually driven by a user. **The update process is not bi-directional because there is no indication in Fane that model changes trigger an automatic request to the EAP.** Rather, the update process is a static process that replaces model data with EAP data(the Excel spreadsheet values) on a one time basis. Any further updates are triggered by the user and move data from the spreadsheet to the model to replace the model data without a continuing integration. Fane discloses changes to the spreadsheet being reflected in the model but does not disclose changes in the model following a model update being reflected in the spreadsheet. **There is absolutely no indication that direct changes to the CAD model are reflected in the spreadsheet. This lack of bidirectional data flow in Fane results from the fact that the spreadsheet data is added to the model but is not integrated into the model.** This integration of EAP output data into the model such that subsequent model changes trigger an automatic request for additional EAP output data is anything but a "routine expedient".

The Examiner's contention that the original setup of values in the spreadsheet anticipates claim 1 is simply misplaced for the reasons set forth above. Claim 1 makes clear that the determination of the need for updated EAP output data, and the subsequent request for and recalculation of EAP output data, occur following a modification to the model. The modification to the model occurs after the original output data has been integrated into the model. Fane discusses creating and then modifying the spreadsheet in order to update model values. The two processes being described are fundamentally different. Both the sequence of steps and the direction of data flow are different. Since Fane does not anticipate claim 1, it also does not anticipate dependent claims 2 and 5-7 which include all the limitations of claim 1.

Claim 8 (upon which claims 9-14 are dependent) has been amended to remove the objected to limitation and to clarify that the EAP output data is integrated into the model such that future changes to the model require additional calculations to be performed by the EAP. Claim 8 has also been amended to indicate that the EAP is called programmatically without user input following the modification of the model. As noted above, Fane fails to anticipate these

elements. Since Fane fails to anticipate claim 8, dependent claims 11-14 which include all of the limitations of claim 8, are also not anticipated.

Claim 19 has been amended to clarify that the determination that the modification of the model requires recalculation of the output data from the EAP occurs programmatically. As previously discussed, Fane does not anticipate this aspect of the claimed invention. Rather Fane is a user-driven procedure (instead of a model-driven procedure) that replaces data values in the model as a result of a user command. Since Fane fails to anticipate claim 19, dependent claim 20 which includes all of the limitations of claim 19, is also not anticipated.

Claim 23 has been amended to indicate that output data is integrated into the model such that future changes to the model require future calculations to be performed by the EAP. For the reasons discussed above, Fane lacks this limitation of the claimed invention. Since Fane fails to anticipate claim 23, dependent claims 24-26 which include all of the limitations of claim 23, are also not anticipated.

Claim Rejections Pursuant to 35 U.S.C. §103(a)

The Examiner indicated that claims 3-4, 9-10, 15-18 and 21-22 were rejected pursuant to 35 U.S.C. §103 as being obvious based on Fane in view of Cottrell et al, "CHDStd- A Model for Deep Submicron Design Tools", Design Automation Conference 1998, Proceedings of the ASP-DAC 1998, Asia and South Pacific, pages 249-255 (hereafter "Cottrell et al"). In light of the amendments above and the reasons discussed below, the rejections are respectfully traversed.

Summary of Cottrell

Cottrell et al discuss an Integrated Data Model (IDM) technology being used in semiconductor chip design. The IDM works with a central repository of chip component data that is used during chip design. The IDM supports a callback feature that allows an application to register methods to be invoked on specific object events.

All of the claims rejected pursuant to 35 U.S.C. §103 focus on the registration of the EAP with the CAD package. For example, claim 3 is dependent on claim 1 and includes the additional element of registering the EAP with the CAD package. Claim 4 is dependent on claim 3 and indicates that the registering step registers a callback to the EAP from the CAD package. Claim 21 is dependent upon independent medium claim 19 and is otherwise the same as claim 3. Claim 22 is dependent upon claim 21 and is otherwise the same as claim 4. Claim 9 is dependent upon independent claim 8 and indicates the step of registering the EAP with a CAD program. Claim 10 is dependent upon claim 9 and indicates that the registering step registers a callback that is called from the CAD program to access the EAP. For all of the claims rejected pursuant to 35 U.S.C. §103, the Examiner indicated that it would have obvious for one of ordinary skill in the art to combine the invention of Cottrell et al with the teachings of Fane to arrive at the claimed invention. However, the teachings of Fane do not include all of the elements of the underlying independent claims. Assuming for the sake of discussion that there was some motivation to combine Cottrell et al with the teachings of Fane (a proposition Applicants contest), the combination of references would still lack all of the elements of the claimed invention. Thus claims 3-4, 9-10 and 21-22 are not rendered obvious by Fane in view of Cottrell et al.

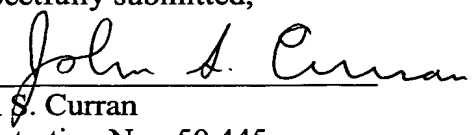
Similarly, claim 15 (upon which claims 16-18 are dependent) has been amended to clarify that the EAP output data is integrated into the model such that future changes to the model require additional calculations to be performed by the EAP. As noted above, Fane fails to disclose the integration of the EAP output data into the model such that future changes to the model require additional calculations to be performed by the EAP. Cottrell et al also lacks these limitations. The combination of references thus fails to render obvious claim 15. Since the combination of references fails to disclose, teach or suggest all of the elements of claim 15, dependent claims 16-18, which include all of the limitations of claim 15, are also not rendered obvious by the combination of Fane in view of Cottrell et al.

In view of the above, each of the presently pending claims 1-26 in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 12-0080, under Order No. PAS-094 from which the undersigned is authorized to draw.

Dated: October 28, 2003

Respectfully submitted,

By 

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Attachments

VERSION WITH MARKINGS SHOWN

1. (currently amended) In a computer system running a computer-aided design (CAD) package and an external application program (EAP), a method, comprising the steps of:

providing a model of an object in the CAD package, wherein said model includes output data from the EAP integrated into said model;

modifying the model;

determining programmatically that the modifying of the model requires recalculation of the output data from the EAP; and

in response to the determining, programmatically sending new input data to the EAP and obtaining new output data from the EAP.

2. (original) The method of claim 1 wherein the method further comprises the step of calling the EAP from the CAD package to obtain the new output data.

3. (original) The method of claim 1 wherein the method further comprises the step of registering the EAP with the CAD package.

4. (original) The method of claim 3 wherein the registering registers a callback to the EAP from the CAD package.

5. (original) The method of claim 1 wherein the EAP performs analysis on at least a portion of the model to produce the original output data and the new output data.

6. (original) The method of claim 5 wherein the analysis is an engineering analysis.

7. (original) The method of claim 1 wherein the method further comprises the steps of:

further modifying the model;

determining that the further modifying of the model requires further recalculation of the output data from the EAP; and

in response to the determining that the further modifying of the model requires further recalculation of the output data, obtaining new output data from the EAP.

8. (currently amended) In a computer system having a computer-aided design (CAD) package for manipulating a model of an object, a method, comprising the steps of:

~~executing an object method recorded in said model of an object, the recorded object method comprising the steps of:~~

exporting data from a CAD model in a CAD program to an external application program (EAP);

using the exported data as input data to execute the EAP and obtain output data from the EAP;

importing the output data into the CAD program from the EAP;

integrating the output data into the CAD model such that future changes to the model require additional calculations to be performed by the EAP;

modifying the CAD model so that the input data to the EAP changes to new input data;

updating the output data by programmatically calling the EAP without user input and passing the new input data to the EAP following the modification of said model; and

automatically integrating the updated output data into the CAD model without a user request.

9. (original) The method of claim 8 wherein the method further comprises the step of registering the EAP with the CAD program.

10. (original) The method of claim 9 wherein the registering comprises registering a callback that is called from the CAD program to access the EAP.

11. (original) The method of claim 8 wherein the CAD model is a feature-based model.

12. (original) The method of claim 8 wherein the CAD model is a parametric model.

13. (previously amended) The method of claim 8 wherein at least one of said integrating the output data into the CAD model and said automatically integrating the updated output data into the CAD model comprises adding parameters to the CAD model.

14. (previously amended) The method of claim 8 wherein at least one of said integrating the output data into the CAD model and said automatically integrating the updated output data into the CAD model comprises adding geometric entities to the CAD model.

15. (currently amended) A computer-aided design (CAD) system, comprising:

a CAD program;

an external application program (EAP) that is external to the CAD program;

a model of an object that contains output data from the EAP integrated into the model such that future changes to the model require additional calculations to be performed by the EAP; and

a registration facility for registering the EAP with the CAD program so that the CAD program calls the EAP when the output data from the EAP in the model needs updating as a result of changes to the model.

16. (original) The CAD system of claim 15 wherein the registration facility registers a callback from the CAD program to the EAP.

17. (original) The CAD system of claim 15 wherein the model is a feature-based model.

18. (original) The CAD system of claim 15 wherein the model is a parametric model.

19. (currently amended) In a computer system running an external application program (EAP) and a computer-aided design (CAD) package with a model of an object that includes output data from the EAP, a computer-readable medium holding computer-executable instructions for performing a method, comprising the computer-implemented steps of:

modifying the model;

determining programmatically that the modifying of the model requires recalculation of the output data from the EAP; and

in response to the determining, sending new input data to the EAP and obtaining new output data from the EAP.

20. (original) The computer-readable medium of claim 19 wherein the method further comprises the step of calling the EAP from the CAD package to obtain the new output data.

21. (original) The computer-readable medium of claim 19 wherein the method further comprises the step of registering the EAP with the CAD package.

22. (original) The computer-readable medium of claim 21 wherein the registering registers a callback to the EAP from the CAD package.

23. (original) The computer-readable medium of claim 19 wherein the EAP performs analysis on at least a portion of the model to produce the output data and the new output data.

24. (currently amended) In a computer system having a computer-aided design (CAD) package for manipulating a model of an object, a computer-readable medium holding computer-executable instructions for performing a method, comprising the computer-implemented steps of:

importing output data into the CAD program from an external application program (EAP);

integrating the output data into the model <u>such that future changes to the model require additional calculations to be performed by the EAP</u>;

modifying the model so as to require updating of the output data; and

automatically updating the output data by calling the EAP with new input data without a user request.

25. (original) The computer-readable medium of claim 24 wherein the model is feature-based.

26. (previously amended)The computer-readable medium of claim 24 wherein the model is parametric

Approved 11/10/03. H.D.

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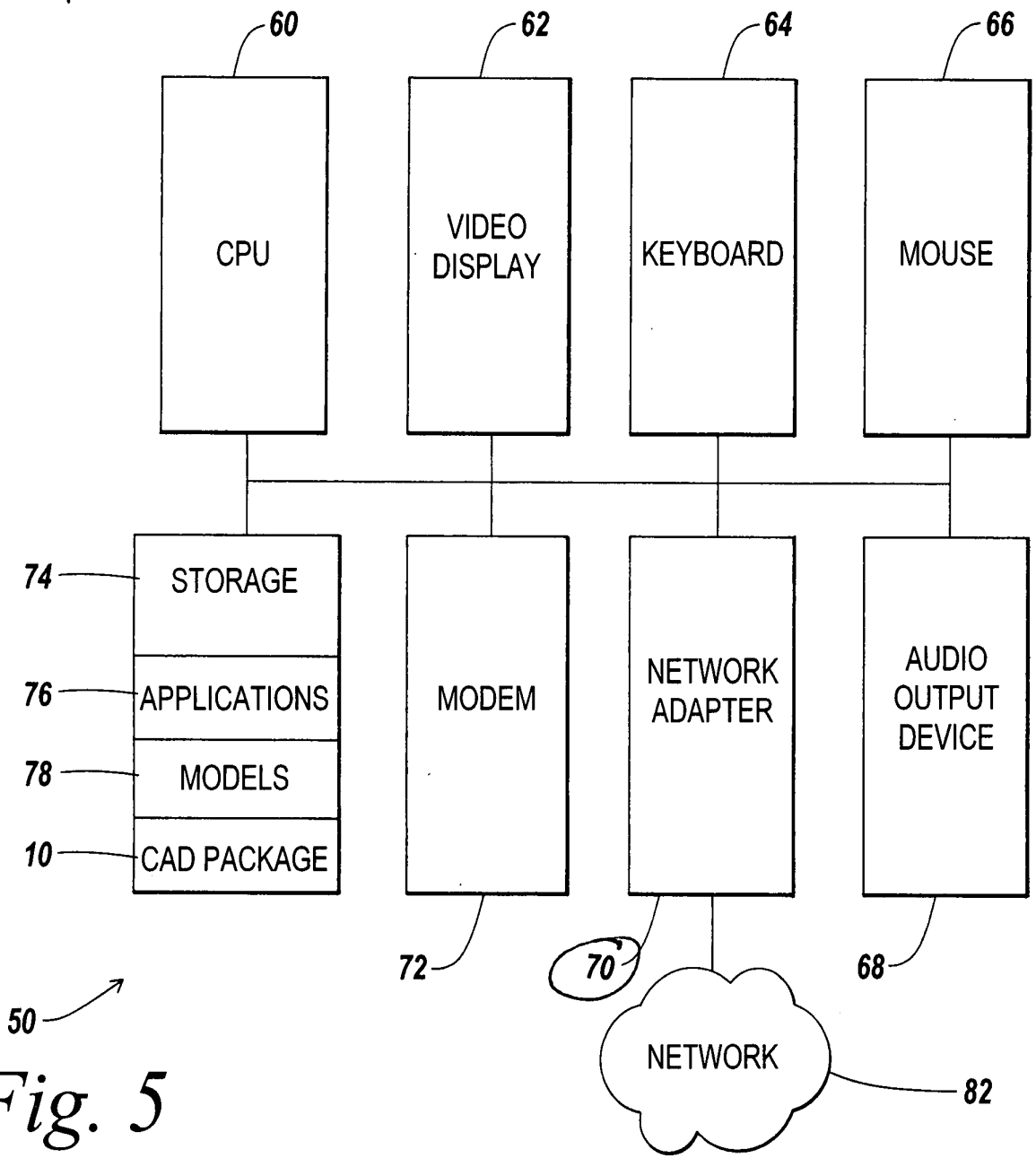

Fig. 5

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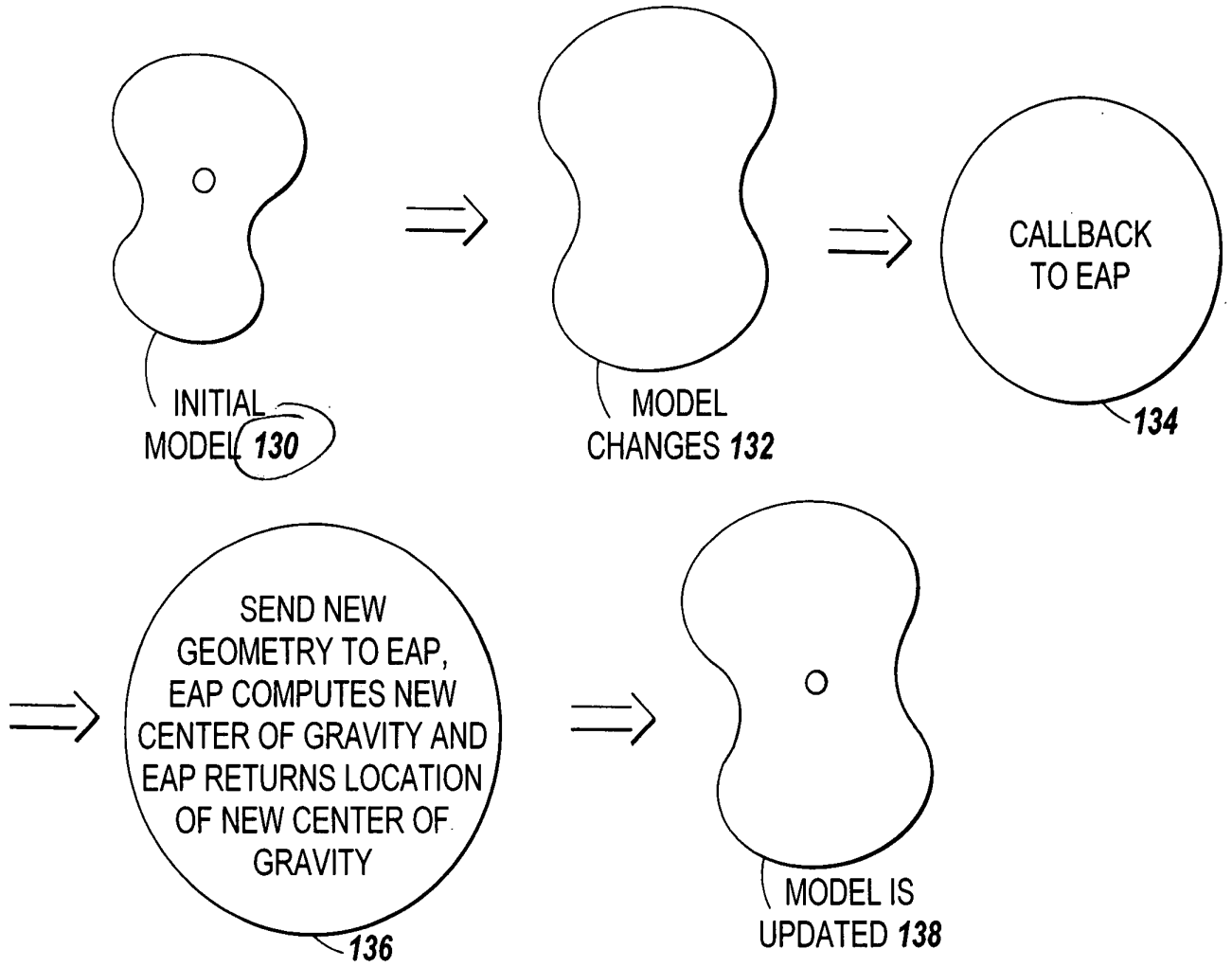

Fig. 9